Name _____

# Alcoholic Fermentation Lab

A moist acid medium containing sugars is likely to undergo alcoholic fermentation by yeast cells. Most fruit juices provide these conditions and at temperatures of 20-30°C, readily support the growth of yeast cells. In this investigation, we will explore the process of alcoholic fermentation in yeast cells.

Purpose:

- To determine the products of fermentation
- To investigate the effect of temperature on the rate of fermentation

Hypothesis: I predict that fermentation will occur more quickly at (HIGHER/LOWER) temperatures.

Procedure:

Day 1:

1. Observe the control set-ups (no yeast)
2. Obtain two test tubes and two balloons.
    - Record the color of your balloon here: _____
3. Fill each tube about ¾ full with grape juice. Place 10 drops of yeast culture into each tube and gently swirl it.
4. Cover the test tubes with balloons.
5. Draw the appearance of balloons on the test tubes in your "before" data.
6. Put one test tube in the rack for the incubator and one in the rack for the fridge.

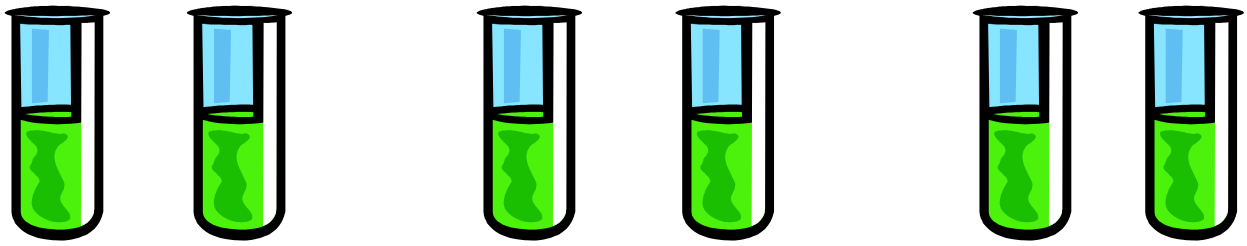
Day 2:

1. Draw the appearance of each balloon in your "after" data.
2. Find the circumference of each balloon and record the measurement (in cm) in Table 1.
3. Prepare a sample cup with about ½ oz of water and 5 drops of BTB and record the color of the water.
4. Carefully remove the balloons from the tubes, pinching off the gas.
5. Carefully insert one end of a straw into one balloon, pinching off the air around it.
6. Insert the other end of the straw into the water with the BTB.
7. Slowly squeeze the balloon to transfer the gas from the balloon to the water through the straw.
8. Repeat with the second balloon.
9. Record the color of the water after the gas from both balloons was added in Table 2.
10. Smell the contents of both tubes.
11. Clean up.

Data:

Make a diagram to show the "before" and "after" of the controls and your two test tubes. Draw what the balloons look like.

| Control | Fridge | Incubator |
|---|---|---|
| 4°C and 37°C | 4°C | 37°C |



BEFORE AFTER BEFORE AFTER BEFORE AFTER

Table 1: Amount of Gas Production

| Temperature | Circumference |
|---|---|
| | |
| | |

Table 2: Identification of Gas

| | |
|---|---|
| Starting color of BTB + water | |
| Color of BTB + gas | |

General Equation

_____ + yeast → _____ + _____

Results:

1. What **evidence** do you have that the alcoholic fermentation of fruit juice depends on the presence of yeast?

2. What gas is produced during alcoholic fermentation?

3. What **evidence** do you have that alcoholic fermentation of fruit juice produces that particular gas?

4. What **evidence** do you have that alcoholic fermentation of fruit juice produces alcohol?

5. How does **temperature** affect the **amount of gas** produced by fermentation?

6. How does **temperature** affect the overall **rate** of alcoholic fermentation?

7. How might the wine industry apply what you learned from this lab? **Be specific!**

Conclusion:
Write AT LEAST 3 SENTENCES describing what you learned from this lab.
(Be specific!)